

**What Is Claimed Is:**

1           1.       A method for receiving multiple streams of Internet Protocol (IP)  
2 packets that are interleaved together into a single stream of transport packets,  
3 comprising:  
4           receiving the single stream of transport packets, wherein the single stream  
5 of transport packets includes multiple streams of IP packets that converted into  
6 transport protocol packets and are then interleaved together into the single stream  
7 of transport packets;  
8           using the single stream of transport packets to reassemble IP packets for  
9 the multiple streams of IP packets within a single IP packet buffer;  
10          keeping track of the order in which reassembly is completed for IP packets  
11 within the single IP packet buffer;  
12          reading the IP packets out of the single IP packet buffer in the order in  
13 which reassembly is completed; and  
14          forwarding the reassembled IP packets to their destinations as specified by  
15 IP addresses contained in the IP packets.

1           2.       The method of claim 1, wherein keeping track of the order in  
2 which reassembly is completed involves maintaining a circular buffer containing  
3 pointers to completed IP packets in the single IP packet buffer, wherein a pointer  
4 to a completed IP packet is entered into the circular buffer upon completion of the  
5 IP packet.

1           3.       The method of claim 2, wherein reading the IP packets out of the  
2 single IP packet buffer in the order in which packets are completed involves:

3           advancing a buffer pointer around the circular buffer containing pointers to  
4   completed IP packets; and  
5           reading the completed IP packets through pointers that are pointed to by  
6   the buffer pointer;  
7           whereby the completed IP packets are read out of the single IP packet  
8   buffer in the order in which they were completed.

1           4.     The method of claim 1, wherein the single IP packet buffer is  
2   organized as a circular buffer, wherein buffers for incoming IP packets are  
3   appended to the end of the circular buffer.

1           5.     The method of claim 1, wherein reassembling the IP packets from  
2   the transport packets involves maintaining a write pointer into the single IP packet  
3   buffer for each stream of IP packets, wherein each write pointer points to a packet  
4   being reassembled for an associated stream of IP packets.

1           6.     The method of claim 5, wherein each write pointer includes:  
2   a start pointer that points to the start of a packet being received for the  
3   associated stream within the single IP packet buffer;  
4   a number of bytes received so far for the packet being received; and  
5   logic that calculates the write pointer from the start pointer and the number  
6   of bytes received so far.

1           7.     The method of claim 1, wherein using the single stream of  
2   transport packets to reassemble IP packets involves:  
3   receiving a single transport packet that includes an end section of a first IP  
4   packet and a beginning section of a second IP packet;

5 directing the end section of the first IP packet to a first location in the  
6 single IP packet buffer where the first IP packet is being reassembled; and  
7 directing the beginning section of the second IP packet to a second  
8 location in the single IP packet buffer where the second IP packet is being  
9 reassembled.

1 8. The method of claim 1, wherein the single stream of transport  
2 packets includes MPEG2 transport packets.

1 9. The method of claim 1, wherein reassembling IP packets involves  
2 filtering transport packets based upon packet identifiers (PIDs) to filter out  
3 transport packets containing data that is not of a specified type for the IP packets.

1 10. The method of claim 1, wherein reassembling IP packets involves  
2 checking continuity for transport packets to ensure that all transport packets that  
3 make up an IP packet are received in sequential order.

1 11. The method of claim 1, further comprising, filtering IP packets  
2 based upon media access control (MAC) addresses to filter out IP packets that are  
3 not directed to an IP destination address on a local network.

1 12. The method of claim 1, wherein the single stream of transport  
2 packets is received from a satellite.

1 13. An apparatus that is configured to receive multiple streams of  
2 Internet Protocol (IP) packets that are interleaved together into a single stream of  
3 transport packets, comprising:

4 a receiver that is configured to receive the single stream of transport  
5 packets, wherein the single stream of transport packets includes multiple streams  
6 of IP packets that converted into transport protocol packets and are then  
7 interleaved together into the single stream of transport packets;  
8 a single IP packet buffer in which IP packets are reassembled;  
9 a reassembly mechanism that is configured to reassemble IP packets for  
10 the multiple streams of IP packets from the single stream of transport packets;  
11 an ordering mechanism that is configured to keep track of the order in  
12 which reassembly is completed for IP packets within the single IP packet buffer;  
13 a reading mechanism that is configured to read the IP packets out of the  
14 single IP packet buffer in the order in which reassembly is completed; and  
15 a forwarding mechanism that is configured to forward the reassembled IP  
16 packets to their destinations as specified by IP addresses contained in the IP  
17 packets.

1 14. The apparatus of claim 13,  
2 wherein the ordering mechanism includes a circular buffer containing  
3 pointers to completed IP packets in the single IP packet buffer; and  
4 wherein the ordering mechanism is configured to enter a pointer to a  
5 completed IP packet into the circular buffer upon completion of the IP packet.

1 15. The apparatus of claim 14, wherein the reading mechanism is  
2 configured to:  
3 advance a buffer pointer around the circular buffer containing pointers to  
4 completed IP packets; and to  
5 read the completed IP packets through pointers that are pointed to by the  
6 buffer pointer;

7           whereby the completed IP packets are read out of the single IP packet  
8   buffer in the order in which they were completed.

1           16.    The apparatus of claim 13, wherein the single IP packet buffer is  
2   organized as a circular buffer, wherein buffers for incoming IP packets are  
3   appended to the end of the circular buffer.

1           17.    The apparatus of claim 13, wherein the reassembly mechanism  
2   includes a write pointer into the single IP packet buffer for each stream of IP  
3   packets, wherein each write pointer points to a packet being reassembled for an  
4   associated stream of IP packets.

1           18.    The apparatus of claim 17, wherein each write pointer includes:  
2   a start pointer that points to the start of a packet being received for the  
3   associated stream within the single IP packet buffer;  
4   a number of bytes received so far for the packet being received; and  
5   logic that calculates the write pointer from the start pointer and the number  
6   of bytes received so far.

1           19.    The apparatus of claim 13, wherein the reassembly mechanism is  
2   configured to:  
3   receive a single transport packet that includes an end section of a first IP  
4   packet and a beginning section of a second IP packet;  
5   direct the end section of the first IP packet to a first location in the single  
6   IP packet buffer where the first IP packet is being reassembled; and to  
7   direct the beginning section of the second IP packet to a second location  
8   in the single IP packet buffer where the second IP packet is being reassembled.

1           20.    The apparatus of claim 13, wherein the single stream of transport  
2 packets includes MPEG2 transport packets.

1           21.    The apparatus of claim 13, wherein the reassembly mechanism  
2 includes a packet identifier (PID) filter that is configured to filter transport packets  
3 based upon packet identifiers (PIDs) in order to filter out transport packets  
4 containing data that is not of a specified type for the IP packets.

1           22.    The apparatus of claim 13, wherein the reassembly mechanism  
2 includes a continuity checker that is configured to check continuity for transport  
3 packets to ensure that all transport packets that make up an IP packet are received  
4 in sequential order.

1           23.    The apparatus of claim 13, further comprising, media access  
2 control (MAC) filter that is configured to filter IP packets based upon MAC  
3 addresses in order to filter out IP packets that are not directed to an IP destination  
4 address on a local network.

1           24.    The apparatus of claim 13, wherein the single stream of transport  
2 packets is received from a satellite.